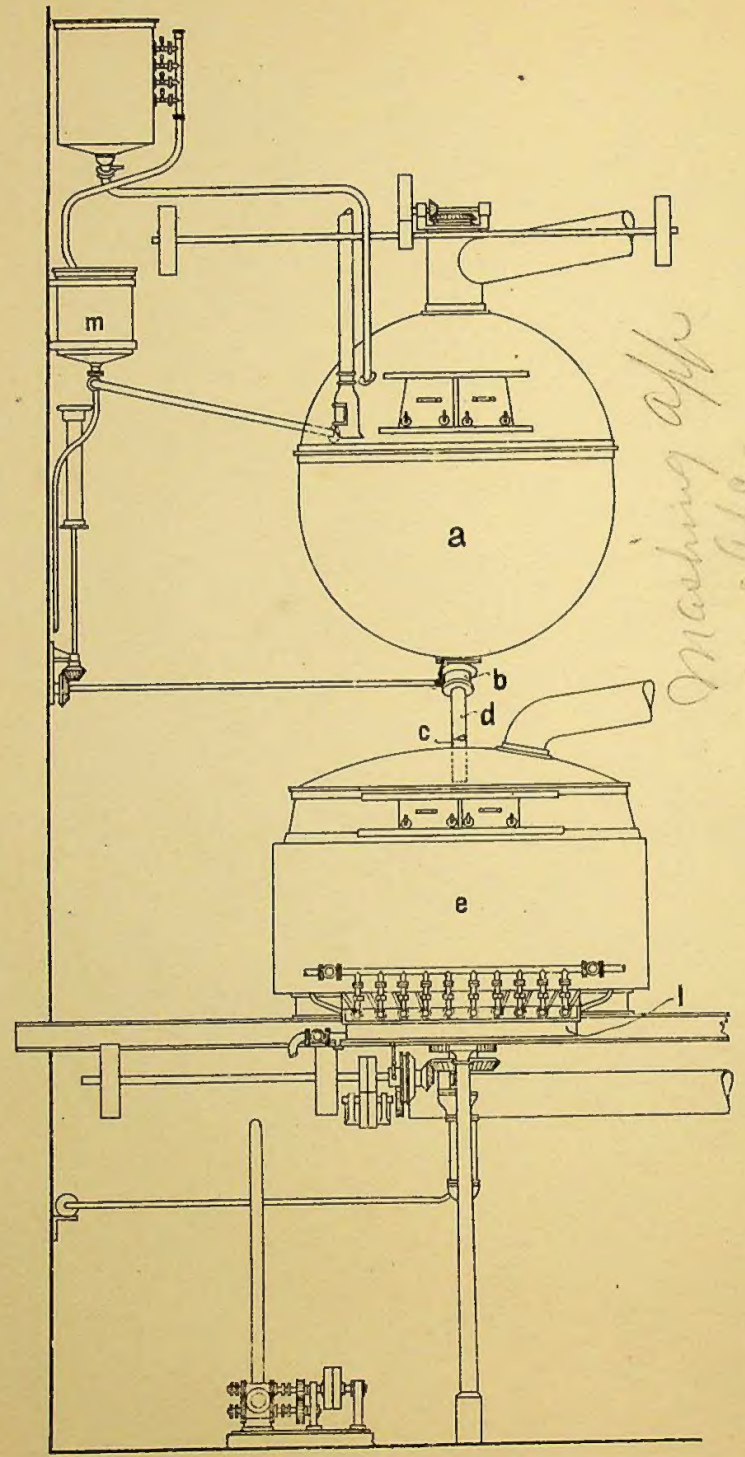







195. ALCOHOL.
 Mashing-
 Processes.

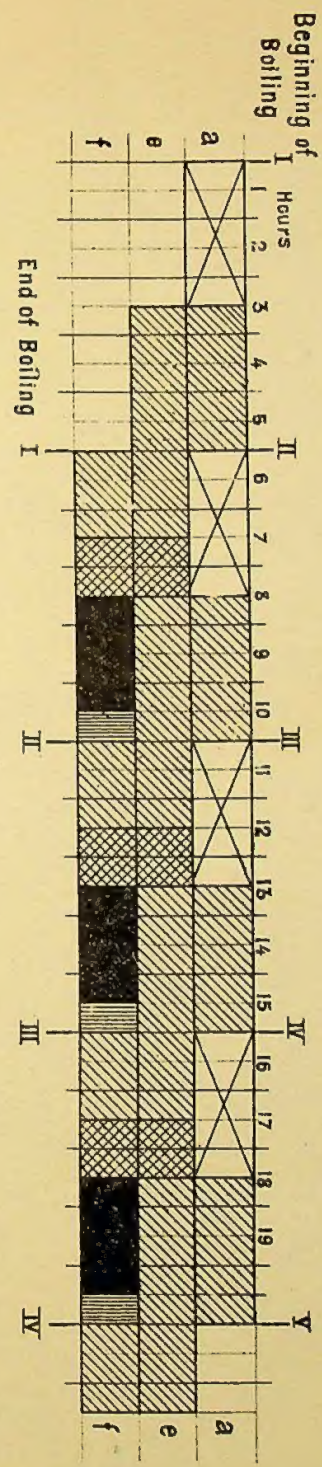


App. for mashing

195. ALCOHOL.
 Mashing-
 Processes.

-  Mash process [from commencement of mashing up to the drawing-off of the main-wort inclusive.]
-  Clearing process.
-  Finish of the clearing process, after saccharification, cleaning of the clearing vat and bringing the brewing copper to the boil.
-  Boiling of the brewing copper.
-  Cleaning of the brewing copper.

brewing copper to the boil.



[This Drawing is a reproduction of the Original on a reduced scale.]

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N° 18,944



A.D. 1899

Date of Application, 20th Sept., 1899

Complete Specification Left, 20th June, 1900—Accepted, 18th Aug., 1900

PROVISIONAL SPECIFICATION.

Process and Brewery Apparatus for the Continuous Production of Beer.

We, GOTTFRIED KREUTZER and JEAN SCHMITZ, Managers of the Deutsche Kapital Versorgungs Bank, G. m. b. H. (Limited Company), both of 12, Neumarkt, of Cologne, in the Province of Rhineland and Kingdom of Prussia, do hereby declare the nature of this invention to be as follows:—

5 All our great brewing houses of to day suffer from the great disadvantage of their efficiency being very limited, since in most of them a continuous working *i.e.* brewing is impossible, and in the rest only to a limited degree, the working time *i.e.* the length of the single brewing process being very long.

With a simple brewing apparatus consisting of two chief vessels *viz.* 1) mash tun and clearing vat, 2) mash and wort copper a boiling according to a process still in use at present always lasts from 12—13 hours, and even when Schmitz's process (English Patent No. 28579/1897) is employed it still takes from 8—9 hours. With our most efficient double brewing apparatus consisting of four chief vessels *viz.*: 1) mash tun, 2) clearing vat, 3) mash copper, 4) wort or beer copper, the time necessary for each boiling when the work is carried out uninterruptedly is always from 8—10 hours, so that within 24 hours at most as many as three boilings can be made. But the double brewing apparatus, apart from the greater cost of purchasing and working it, needs nearly twice as much space for fitting it up as a simple brewing apparatus, a fact which, especially in thickly built towns, where there is already a want of room and space is very dear, has a very damaging effect.

The object of the present invention is to offer the brewer a process and brewing-apparatus which based on the application of the Schmitz brewing method, are unequalled as regards efficiency and cheapness, on the one hand making use of the extraordinary high yields of the Schmitz process while working continuously, whereas on the other hand: 1) the brewing apparatus does not take more space than an ordinary simple apparatus, 2) the brewing apparatus, since it only makes use of three chief vessels, is cheaper as regards the original cost and working expenses than otherwise a double brewing apparatus, 3) since with the new process and with the new brewing apparatus a boiling can be made every 4½ to 5 hours, the production of beer is in the same time very considerably greater (almost 60 %) than with all other processes when using the expensive double brewing apparatus, the size of the coppers being equal in both cases.

In the accompanying drawings Fig. 1 and 2 (Sheet 1) represent a plant of the new brewing establishment in a front view with a section through the mash tun *a* and the clearing vat *c* and in a view from above, Fig. 3 (Sheet 2) represents a side view of Fig. 1, and on Sheet 3, a diagram of the duration of the different boilings and the times necessary for the different operations in the different apparatus is given with a short explanation of the manner of the illustrating the single operations in the diagram.

The new process is distinguished from those hitherto known by the fact that

[Price 8d.]

Process and Brewery Apparatus for the Continuous Production of Beer.

in order to reduce the time of drawing off as much as possible, the clarification of the wort is not delayed until the brewing copper is empty and ready to receive it, but is already begun when the copper is being used for the previous boiling, the wort being cleared during this time in the mash tun, and not until afterwards, when the copper is empty, being further cleared therein, and at the same time the wort that has been previously put into the mash tun being allowed to flow in. 5

Naturally, this does not refer to the first boiling, but, beginning from the second, to all boilings that follow each other continuously.

The new brewing establishment consists essentially of three apparatus, or as the brewer says, chief vessels (not counting, naturally, the other pumps, pipes, and the like, belonging to every brewery on the Schmitz system, these been assumed as already belonging to every brewery) viz.: 10

1.) The mash tun *a* which at the same time is the mash copper containing a suitable mash and agitator apparatus and fitted below with a double mouth *c* or *d* to be used alternately with a three-way-cock or several single cocks, for mash and wort, as will be seen from the drawing. 15

2) The clearing vat *e* with a machinery for loosening up and driving out the grains. 20

3) The wort and beer copper *f*, also called hop boiler with agitator. 20

All other parts are exactly the same and arranged in the same manner as in every other brewery.

If these three vessels are fitted up in a suitable manner, as shown in detail in a special example in the drawing, and if the new process of working be adopted, it is possible to carry out the Schmitz brewing process in such a manner that, with only three chief vessels, in every $4\frac{1}{2}$ to 5 hours a boiling of beer is finished an efficiency which up to to-day is unattained and quite new. 25

The manner of working in detail is as follows:

In the Schmitz process the mashing process lasts about from $1\frac{3}{4}$ to 2 hours (absolute decoction), the clearing process from 4 to $4\frac{1}{2}$ hours, and the wort boiling process inclusive the drawing off from 2 to $2\frac{1}{2}$ hours. 30

In order to be quite sure we take the maximum numbers $2 + 4\frac{1}{2} + 2\frac{1}{2}$ and base the specification on them.

In the ordinary manner, as in every other brewery, the malt grist (in this case the finest grist or malt flour) coming from the grist box is mashed in *a* by a preliminary mashing cylinder. 35

Here the mashing process is carried out according to Schmitz so that after $1\frac{3}{4}$ to 2 hours the mashing can be finished in the clearing vat *e* which is previously heated.

The clearing commences at once in *e* after from 5—10 minutes, and lasts under ordinary circumstances about 4 hours. After the process of clearing is over, the entire wort is in the wort or beer copper *f* where it already is converted into beer in about $2\frac{1}{2}$ hours and is drawn off *i.e.* pumped into the cooler. 40

In the meanwhile, 2 hours before the clearing in *e* was finished, mashing had already been carried out in *a*. 45

The clearing vat *e* has, during this time, been emptied of the malt-husks, cleaned and polished, and therefore the mash can be allowed immediately to pass down from *a* to *e* and be mashed; the clearing of the boiling II can then immediately recommence.

At this time, however, the boiling I in the wort copper *f* that has just been cleared, is converted into beer, the operation lasting $2\frac{1}{2}$ hours. 50

The wort copper is therefore not free, so as to be able to receive the wort flowing from *e* during these $2\frac{1}{2}$ hours. The mash tun *a*, on the other hand, is during the same time not used for its real purpose, which is of great advantage to the unhindered progress of the boiling II, since, so long as the copper is not being used for the first boiling, the empty mash tun can be employed for collecting the wort coming from *e*. 55

Process and Brewery Apparatus for the Continuous Production of Beer.

This is done by the wort being sucked out of the clearing vat by means of the wort pump through the pipes *g, i*, after the mouth *h* has been closed by means of the three-way-cock *k* and sucked from the clearing vat *l* upwards into the mash tun *a*.

5 Thus the wort flowing from *e* during the first $2\frac{1}{2}$ hours of the clearing process, is pumped to *a* by the wort pump from where, after boiling I in *f* is ready and has been removed, it is carried to the copper *f* in a few minutes after the cock or slide *b* in the pipe *d* has been opened or the three-way-cock below *a* has been adjusted.

10 Thus *a* again becomes free for the mashing for boiling III.

The clearing process nevertheless now continues for the remaining $1\frac{1}{2}$ hours without any interference (the stuff instead of being pumped to *a* from *e* is cleared as usual direct from *e* towards *f*) *a* is then not used again for the clearing until at the next boiling during the first $2\frac{1}{2}$ hours.

15 The alternate use of the vessels *a* and *f* during the clearing process for the reception of the wort that flows off, is very simple, and, as far as attendance goes, only necessitates the corresponding adjustment of the cocks or slides and the putting on or off of the wort pumps at the suitable time.

In this manner the various brewing processes are carried out in such a manner

20 that a new boiling can be made every $4\frac{1}{2}$ to 5 hours.

The accompanying representation of the successive brewing processes clearly shows this manner of working.

All three vessels are therefore, deducting the short time used for cleaning, continually at work.

25 Dated this 16th day of September 1899.

For GOTTFRIED KREUTZER and
JEAN SCHMITZ,
Bernh. Brockhues.

COMPLETE SPECIFICATION.

30 **Process and Brewery Apparatus for the Continuous Production of Beer.**

We, GOTTFRIED KREUTZER and JEAN SCHMITZ, Managers of the Deutsche Kapital Versorgungs Bank, G. m. b. H. (Limited Company) both of 12, Neumarkt, of Cologne, in the Province of Rhineland and Kingdom of Prussia,

35 do hereby declare the nature of this invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

All our great brewing houses of to day suffer from the great disadvantage of their efficiency being very limited, since in most of them a continuous working

40 *i.e.* brewing is impossible and in the rest only to a limited degree, the working time *i.e.*, the length of the single brewing process being very long.

With a simple brewing apparatus consisting of two chief vessels *viz.* 1) mash tun and draining vat, 2) mash and wort copper a boiling according to a process still in use at present always lasts from 12—13 hours, and even when Schmitz's

45 process (English Patent No. 28579/1897) is employed it still takes from 8—9 hours. With our most efficient double brewing apparatus consisting of four chief vessels *viz.*: 1) mash tun, 2) draining vat, 3) mash copper, 4) wort or beer copper, the time necessary for each boiling when the work is carried out uninterruptedly is always from 8—10 hours, so that within 24 hours at most

50 as many as three boilings can be made. But the double brewing apparatus,

Process and Brewery Apparatus for the Continuous Production of Beer.

apart from the greater cost of purchasing and working it, needs nearly twice as much space for fitting it up as a simple brewing apparatus, a fact which, especially in thickly built towns, where there is already a want of room and space is very dear, has a very damaging effect.

The object of the present invention is to offer the brewer a process and brewing-apparatus, which based on the application of the Schmitz brewing method, are unequalled as regards efficiency and cheapness, on the one hand making use of the extraordinary high yields of the Schmitz process while working continuously, whereas on the other hand: 1) the brewing apparatus does not take more space than an ordinary simple apparatus, 2) the brewing apparatus, since it only makes use of three chief vessels, is cheaper as regards the original cost and working expenses than otherwise a double brewing apparatus, 3) since with the new process and with the new brewing apparatus a boiling can be made every $4\frac{1}{2}$ to 5 hours, the production of beer is in the same time very considerably greater (almost 60 %) than with all other processes when using the expensive double brewing apparatus, the size of the coppers being equal in both cases.

In the drawings filed with the Provisional Specification Fig. 1 and 2 (Sheet 1) represent a plant of the new brewing establishment in a front view with a section through the mash tun *a* and the draining vat *c* and in a view from above, Fig. 3 (Sheet 2) represents a side view to Fig. 1, and on Sheet 3, a diagram of the duration of the different boilings and the times necessary for the different apparatus is given with a short explanation of the manner in which the single operations are shown in the diagram.

The new process is distinguished from those hitherto known by the fact that in order to reduce the time of drawing off as much as possible, the drainage of the wort is not delayed until the brewing copper is empty and ready to receive it, but is already begun when the copper is still being used for the previous boiling. The wort is drained during this time in the mash tun, and not until afterwards, when the copper is empty, it is further drained therein, and at the same time that part of the wort that has been previously drained into the mash tun is now allowed to flow onto the other part which is drained into the copper.

Naturally this does not refer to the first boiling, but, beginning from the second, to all boilings that follow each other continuously.

The new brewing establishment consists essentially of three apparatus, or as the brewer says, chief vessels (not counting, naturally, the other pumps, pipes, and the like, belonging to every brewery on the Schmitz system, these been assumed as already belonging to every brewery) viz.:

1) The mash tun *a* which at the same time is the mash copper containing a suitable mash and agitator apparatus, and fitted below, as will be seen from the drawing with two mouths *c* and *d* for mash and wort which mouths are used alternately by means of a suitable device for closing the one and opening the other, as for instance a three-way-cock below *a* in the outlet from which branch the two mouths, or a single valve slide or cock *b* in each mouth as designed in the drawing.

2) The draining vat *c* with a machinery for loosening up and driving out the grains.

3) The wort and beer copper *f*, also called hop boiler with agitator

All others parts are exactly the same and arranged in the same manner as in every other brewery.

If these three vessels are fitted up in a suitable manner, as shown in detail in a special example in the drawing filed with the Provisional Specification, and if the new process of working be adopted, it is possible, to carry out the Schmitz brewing process in such a manner that, with only three chief vessels, in every $4\frac{1}{2}$ to 5 hours a boiling of beer is finished, an efficiency which up to to-day is unattained and quite new.

The manner of working in detail is as follows:

In the Schmitz process the mashing process lasts about from $1\frac{3}{4}$ to 2 hours

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(absolute decoction), the draining process from 4 to $4\frac{1}{2}$ hours, and the wort boiling process inclusive the drawing off from 2 to $2\frac{1}{2}$ hours.

In order to be quite sure we take the maximum numbers $2 + 4\frac{1}{2} + 2\frac{1}{2}$ and base the specification on them.

- 5 In the ordinary manner, as in every other brewery, the malt grist, (in this case the finest grist or malt flour) coming from the grist box is mashed in *a* by a preliminary mashing cylinder.

- Here the mashing process is carried out according to Schmitz, so that after $1\frac{3}{4}$ to 2 hours the mashing can be finished in the draining vat *e* which is
10 previously heated.

The draining commences at once in *e* after from 5—10 minutes, and lasts under ordinary circumstances about 4 hours. After the process of draining is over, the entire wort is in the wort or beer copper *f* where it already is converted in to beer in about $2\frac{1}{2}$ hours and is drawn off *i.e.* pumped into the cooler.

- 15 In the meanwhile, 2 hours before the draining in *e* was finished, mashing had already been carried out in *a*.

- The draining vat *e* has, during this time, been emptied of the malt-husks, cleaned and polished, and therefore the mash can be allowed immediately to pass down from *a* to *e* and be mashed; the draining of the boiling II can then
20 immediately recommence.

- At this time, however, the boiling I in the wort copper *f* that has just been drained, is converted into beer, the operation lasting $2\frac{1}{2}$ hours. The wort copper is therefore not free, so as to be able to receive the wort flowing from *e* during these $2\frac{1}{2}$ hours. The mash tun *a*, on the other hand, is during the
25 same time not used for its real purpose, which is of great advantage to the unhindered progress of the boiling II, since, so long as the copper is not being used for the first boiling, the empty mash tun can be employed for collecting the wort coming from *e*.

- This is done by the wort being sucked out of the draining vat by means of
30 the wort-pump through the pipes *g*, *i*, after the mouth *h* has been closed by means of the three-way-cock *k* and sucked from the draining vat *e* upwards into the mash-tun *a*.

- Thus the wort flowing from *e* during the first $2\frac{1}{2}$ hours of the draining process, is pumped to *a* by the wort pump from where, after boiling I in *f* is
35 ready and has been removed, it is carried to the copper *f* in a few minutes after the cock or slide *b* in the pipe *d* has been opened (or the three-way-cock below *a* has been adjusted).

- Thus *a* again becomes free for the mashing for boiling III. The draining process nevertheless now continues for the remaining $1\frac{1}{2}$ hours without any
40 interference (the stuff, instead of being pumped to *a* from *e* is drained as usual direct from *e* towards *f*) *a* is then not used again for the draining until at the next boiling during the first $2\frac{1}{2}$ hours.

- The alternate use of the vessels *a* and *f* during the draining process for the reception of the wort that flows off, is very simple, and, as far as attendance
45 goes, only necessitates the corresponding adjustment of the cocks or slides and the putting on or off of the wort pumps at the suitable time.

In this manner the various brewing processes are carried out in such a manner, that a new boiling can be made every $4\frac{1}{2}$ to 5 hours.

- The representation filed with the Provisional Specification of the successive
50 brewing processes clearly shows this manner of working. All three vessels are therefore, deducting the short time used for cleaning, continually at work.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

- 55 1) Process for the continuous production of beer in the shortest time with 3 chief vessels while making use of the Schmitz brewing method (English Patent

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No. 28579/1897) thereby characterized that the drained wort is carried off and collected in two lots, at first, while the copper is still being used for the preceding boiling by pumping it into the then empty mash tun, but, later on, direct into the copper, the wort which has previously been put into the mash tun, being simultaneously allowed to flow into the latter, so that none of the 5
3 vessels, apart from the time necessary for cleaning, remains idle.

2). The brewing apparatus for the continual production of beer while making use of the process characterized under Claim 1), distinguished by the use of only 3 chief vessels: 1) the mash tun *a*, 2) the draining vat *c*, 3) the wort and beer copper having each in its bottom a discharge-pipe *e*, *d*, that can be 10
closed by a cock or the like, for conducting the mash to the draining vat, or the wort to the brewing copper, connected in such a manner with pump, *etc.*, that it is possible at first to allow the mash to flow from the mash tun into the lower lying draining vat, then to allow wort to flow from the latter, as well as from 15
the mash tun, into the brewing copper, and finally to pump up wort from the draining vat into the mash tun.

Dated this 18th day of June 1900.

For GOTTFRIED KREUTZER and
JEAN SCHMITZ,
B. Brockhues.

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